

REMARKS

Claims 1-3, 5, 7-19, 21, 23-33, and 57-64 were previously pending in the application. Claim 5 is canceled leaving claims 1-3, 7-19, 21, 23-33, and 57-64 for consideration.

Claims 1-3, 11, 13, 16, 18-19, 27, 29, 32 and 57-64 are rejected as anticipated by AVANZINO et al. 6,350,687. Claims 8-10, 14, 24-26, and 30 are rejected as unpatentable over AVANZINO et al. in view of LAWSON 4,978,756. Claims 5, 7, 21, and 23 are rejected as unpatentable over AVANZINO et al. in view of the admitted prior art and claims 12, 15, 17, 31, and 33 are rejected as unpatentable over AVANZINO et al.

Reconsideration and withdrawal of the rejections are respectfully requested because the references do not teach or suggest removing CuOx from a surface and simultaneously or subsequently carrying out an anti-corrosion treatment as recited in claim 1 of the present application.

AVANZINO et al. teach removing contaminants such as abrasives, electrolytes, and copper compounds from the surface of the wafer. AVANZINO et al. at column 7, lines 1-5, also teach exposing the wafer surface to a solution of a passivating compound applied during or subsequent to the wafer cleaning process.

Page 3, lines 1-5, of the present application, discussing the admitted prior art, disclose a carboxylic acid based cleaning solution to remove metal contaminations.

The Official Action states that since AVANZINO et al. teach removing copper compounds in a cleaning step and since the admitted prior art teaches removing metal contaminations during a cleaning treatment, the cleaning treatment of the admitted prior art could be used in conjunction with the cleaning process of AVANZINO et al. to remove metal contaminations.

MPEP §2143.01 states that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

The combinations of references proposed in the Official Action would remove metal contaminations (CuOx) formed on the surface of the wafer. However, AVANZINO et al. at column 6, line 66 through column 7, line 3 teach that suitable conditions under which the passivating layer is formed are when the copper surfaces are exposed to a solution of the passivating compound, allowing the compound to coat and react with the thin native copper oxide on the metal surface. Accordingly, the teachings of AVANZINO et al. require a thin native copper oxide on the metal

surface to react with the passivating compound to coat the copper surfaces. Removing the copper oxide as taught by the admitted prior art would change the principle of operation of AVANZINO et al. by not having a thin native copper oxide layer to react with the passivating compound. Accordingly, the teachings of the references are not sufficient to render the claims *prima facie* obvious.

Claim 18 recites removing CuOx formed during a CMP step from a surface of the semiconductor substrate using a cleaning solution. Claim 63 also recites removing CuOx from a surface and simultaneously carrying out an anti-corrosion treatment. The comments above regarding claim 1 are equally applicable to claims 18 and 63. The remaining claims depend from one of claims 1, 18, and 63 and further define the invention and are also believed patentable over the cited prior art.

The reference to LAWSON is only cited for the teaching of an anti-corrosive agent comprising hetero-cyclic compounds and derivatives thereof. The addition of LAWSON does not overcome the deficiency of the combination of AVANZINO et al. and the admitted prior art. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

In view of the present amendment and the foregoing remarks, it is believed that the present application has been

placed in condition for allowance. Reconsideration and allowance are respectfully requested.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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